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State of California

The Resources Agency

Memorandum

Date : December 4, 1996

To : Steve Yaeger, Program Deputy Director
CALFED Bay-Delta Program

Manucher Alemi, Coordinator
San Joaquin Valley Drainage Implementation Program
Division of Local Assistance

From : **Department of Water Resources**

Subject: SJVDIP Review of CALFED *Preliminary Draft Phase II Alternatives*

The purpose of this memo is to provide comments on the CALFED *Preliminary Draft Phase II Alternatives* and make recommendations to CALFED staff relative to drainage and water quality issues. My comments will address possible conflicts between the *Preliminary Draft Phase II Alternatives* and the recommendations of the San Joaquin Valley Drainage Program's 1990 report titled *A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley.* The San Joaquin Valley Drainage Implementation Program was developed in 1991 to help carry out recommendations of the 1990 plan. My recommendations to CALFED staff are made for the purpose of improving water quality in the Delta and solving drainage and water quality problems in the San Joaquin Valley. These recommendations are based on the 1990 plan which may be updated and revised as new information is acquired.

This memo has been reviewed by the SJVDIP Management Group members and interagency program staff. Comments have been incorporated, but the memo has not been officially adopted by MG and may not reflect all agency members' viewpoints.

COMMENTS

General

1. The only SJVDP subareas that are in the Delta watershed are the Northern and Grasslands subareas. Of these two subareas, a specific action plan for drainage management was recommended in the 1990 plan only for the Grasslands subarea. While the CALFED common program of water use efficiency measures pertains to the entire SJVDP study area, the CALFED common program of water quality improvements has been applied only to the Northern and Grasslands subareas. The CALFED *Phase I Final Documentation Report*, September 1996, contains an explicit statement that CALFED will address the agricultural drainage issue only in San Joaquin Valley lands that drain into the San Joaquin River.

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2. The *Preliminary Draft Phase II Alternatives* state that increased agricultural water use efficiency and water conservation will result in improved drainage water quality. This assumption may not be valid, as indicated by data in the 1996 Central Valley Regional Water Quality Control Board's *Amendments to the Water Control Plan for the San Joaquin River Basin* and the 1996 SJVDIP draft *Drainage Management in the San Joaquin Valley- A Status Report*. Increased agricultural water use efficiency may reduce the total load of some pollutants but may increase the concentration of pollutants in drainage water and in soils, thereby negatively impacting soil productivity.

Drainage Discharge to the San Joaquin River

3. In addition to source control, the principal 1990 plan recommendation for managing shallow groundwater (within the root zone or 5 feet or less from the ground surface) in the Grasslands subarea is increased drainage to regional wetlands and the San Joaquin River. An estimated 50,000 acres of tile-drained agricultural land was discharged to regional wetlands and the San Joaquin River from the Grasslands subarea in 1990. The 1990 plan projected the tile-drainage area discharging to the San Joaquin River would increase to 65,000 acres by the year 2000 and 160,000 acres by the year 2040. The 1990 plan recommended drainage discharge to the San Joaquin River while meeting concentration-based water quality objectives for the San Joaquin River.

4. The principal area of concern for drainage discharge to the San Joaquin River is Grasslands Zone A in the 1990 plan and the nearly coincident drainage problem area in CVRWQCB's *Amendments*. The 1990 plan recommended source control and drainage reuse to reduce drainage water volume and thus salt and boron loads. The plan also recommended that the remaining drainage water be discharged to the San Joaquin River. To reduce selenium, the plan recommended selective land retirement, but only for a total of 3,000 acres.

5. The CALFED common program objective for water quality improvement is to reduce the total influx of pollutants (including salt, selenium, and boron) into the Delta; this objective is in conflict with the 1990 plan recommended action of expanded managed drainage water discharge to the San Joaquin River to meet concentration-based water quality objectives. If protective water quality objectives are met, there would be no need to reduce salts and other constituent loads that will not bioaccumulate. For those elements that do bioaccumulate, load-based objectives may be appropriate.

For agricultural drainage, the *Preliminary Draft Phase II Alternatives* recommend that load reduction be accomplished by increased water use efficiency and water conservation, temporary and permanent land conversion, and drainage water treatment. Although CALFED measures may potentially reduce the salt load, it is unclear whether these measures will effectively meet CALFED's pollutant load reduction targets. While selective land conversion with proper land management may help reduce selenium in drainage water, its contribution to salt load reduction will be minimal. In the absence of cost-effective drainage water treatment technology, we anticipate that CALFED's implementation measures to achieve its load reduction targets will result in salt accumulation in the soil and deteriorating drainage conditions in the Northern and Grasslands subareas.

6. The 1990 plan recommended that drainage discharge to the San Joaquin River be conveyed by extending the San Luis Drain to the San Joaquin River downstream of the confluence with the Merced River. CVRWQCB's 1996 *Amendments* support this concept. CALFED's objective to reduce the total influx of salts and other constituents to the Delta could conflict with this adopted approach.

Land Retirement

7. In *Clarifications for Preliminary Phase II Alternatives*, July 8, 1996, both temporary and permanent land conversions are stated as measures to improve water supply reliability and water quality. Land retirement which is equivalent to CALFED's permanent land conversion concept was only recommended in the 1990 plan for the purpose of managing selenium by isolating poor-quality agricultural land (Class IV) containing elevated concentrations of selenium. In contrast, the Central Valley Project Improvement Act draft *Land Retirement Program Guidelines* (August 10, 1996) specify that one purpose of the program is to assist in implementing water conservation plans. The 1990 plan did not recommend land retirement for the Grasslands subarea by the year 2000 and only 3,000 acres by the year 2040.

8. CALFED's description of temporary land conversion states that conserved water would be used by or could be made available for water transfer by local districts. The draft CVPIA *Land Retirement Program Guidelines* specify that water conserved under that program cannot be used on other land where it will contribute to drainage-related problems.

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Drainage Reuse

9. The only mention of drainage reuse in the *Preliminary Draft Phase II Alternatives* is under water recycling as a component of the water use efficiency common program. No mention is made of drainage reuse as a measure to improve drainage water quality in the Delta. Research data recently collected at drainage reuse demonstration projects indicate that selenium loads in drainage water decrease through drainage water reuse system.

Drainage Treatment

10. The *Preliminary Draft Phase II Alternatives* specifically include construction of wetlands to treat 10,000-15,000 acre-feet of Delta agricultural drainage and additional unspecified measures to treat 20-30 percent of agricultural drainage to remove pollutants (presumably selenium). The CALFED report states that treated drainage water could then be used for irrigation. While wetland treatment of drainage water may remove selenium making the water suitable for discharge or beneficial uses, the treatment process would increase the concentration of salt, thereby limiting the use of treated water to salt-tolerant crops, such as are currently under development in agroforestry systems.

RECOMMENDATIONS

1. CALFED's *Preliminary Draft Phase II, Alternative 3*, offers the greatest potential benefit to the San Joaquin Valley by improving the quality of Central Valley Project/State Water Project water imported from the Delta through an isolated conveyance. The benefit would be achieved by reducing imported salt into the San Joaquin Valley. This alternative would reduce the rate of salt accumulation in San Joaquin Valley soils and the load of salt in drainage from a unit land area to the San Joaquin River but would not achieve a salt balance. Therefore, other salt management measures are necessary. Alternative 3 would be preferred by the SJVDIP.

Alternative 3 also requires the most stringent water quality level of San Joaquin River inflow into the Delta. The 1990 plan recommended expanded managed drainage discharge from Grasslands to the San Joaquin River by the year 2040, subject to meeting water quality standards. I recommend to CALFED that discharge to the San Joaquin River as detailed in the 1990 plan be incorporated in the CALFED Water Quality Common Program.

2. Since CVP/SWP water exported from the Delta is the principal source of salt input to the agricultural lands of the San Joaquin Valley and Tulare/Kern Basin, and since the water use efficiency component is applied to the entire San Joaquin Valley, the potential redirected impacts of CALFED solutions on drainage conditions in the entire San Joaquin Valley should be carefully evaluated.

3. Source control is a recommended action by both CALFED and the 1990 plan. Irrigation and drainage management should be optimized to improve water quality while maintaining soil quality. Source reduction measures recommended by the 1990 plan are, therefore, recommended to CALFED for consideration.

4. The principal recommendation for drainage reduction in the 1990 plan that would also achieve a degree of salt management is drainage reuse and evaporative salt separation. CALFED's support for development of drainage reuse systems, research and design of wildlife-safe evaporation ponds, development of new salt-utilization techniques and markets, and research and refinement of drainage treatment methods would also simultaneously further SJVDIP and CALFED goals. Widespread drainage reuse implementation in the San Joaquin Valley and Tulare Basin, as recommended in combination with other measures in the 1990 plan, could substantially aid CALFED in achieving a reduction in overall agricultural water demand and achieving improvement in San Joaquin River water quality. I must add that some recommendations contained in the 1990 plan, including drainage reuse, are presently in the pilot project phase and may be subject to future modification and refinement.

5. Efforts are underway in the Grasslands subarea to reduce selenium in drainage water. These efforts will help accomplish both CALFED and SJVDIP goals with respect to selenium. There is a need to place more emphasis on management of salt and boron to meet future water quality objectives in the San Joaquin River. Drainage reduction should be emphasized as a means of reducing salt and boron in drainage discharge. The balance of drainage water should be discharged to drainage reuse and evaporation ponds or to the San Joaquin River through a coordinated and managed drainage discharge system while meeting water quality objectives. However, other mechanisms for salt and boron reduction and management may be needed to meet water quality objectives for the San Joaquin River.

6. CALFED should adopt concentration-based water quality objectives instead of load-based objectives for salts, boron, and other constituents with the exception of the bioaccumulative constituents.

7. CALFED's *Bay-Delta Program Phase I Final Report*, September 1996, listed as a potential implementation measure a drainage management program where farmers could receive economic incentives to fallow agricultural lands presently producing harmful drainage. I recommend development of a CALFED program that would provide economic incentives for management of irrigation, drainage, and land-use practices including conversion of selected cropland to nonirrigated pasture land and restoration of a natural grassland ecosystem. This would simultaneously achieve CALFED decreased export demand goals, improve drainage water quality, and restore the ecosystem while maintaining land productivity. However, any land conversion program requires suitable land management planning to minimize potential environmental impacts.

8. In general, I recommend that CALFED consider the information and recommendations contained in the 1990 plan in developing a list of actions to improve water quality in the Delta and drainage conditions in the Valley.

I believe coordination between SJVDIP and CALFED is necessary to develop and implement a combination of actions in a manner that advances the goals of both programs. Wayne Verrill of my staff and I are available to meet with you to discuss the issues raised in this memo. If you have any questions, please call me at (916) 327-1630.

cc: SJVDIP Management Group Members and Alternates

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